

Reducing dielectric constant in printed circuit boards - by incorporating polymeric particles in insulating substrate, hence also reducing dissipation factor and increasing comparative tracking index

Patent Assignee: ALLIED-SIGNAL INC (ALLC )

Inventor: CHU C; HOLTE M D

Number of Countries: 002 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9714280	A1	19970417	WO 96US16400	A	19961010	199721 B
AU 9672646	A	19970430	AU 9672646	A	19961010	199734
TW 370490	A	19990921	TW 96115270	A	19961210	200036

Priority Applications (No Type Date): US 95544418 A 19951010

Cited Patents: 8.Jnl.Ref; JP 3014282; JP 5162240; JP 5162241; JP 63154748; JP 63159441; JP 63268637; JP 6338667; US 5216077

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9714280	A1	E	21	H05K-001/03	
AU 9672646	A			H05K-001/03	Based on patent WO 9714280
TW 370490	A			B32B-027/18	

Abstract (Basic): WO 9714280 A

Reducing the dielectric constant and dissipation factor in printed circuit boards made from metal foil clad insulating substrates comprises incorporating in the insulating substrate polymeric particles of > 0 wt% but at most 25 wt%, having an average diameter between 0.05-30  $\mu$ m.

Also claimed is method for increasing the Comparative Tracking Index (CTI) of insulating substrates used in printed circuit boards comprising incorporating polymeric particles as above in the insulating substrates.

Also claimed is a laminate for use in printed circuit boards comprising an insulating substrate comprising an inner glass fibre reinforced epoxy resin containing polymeric particles as above and covered with layers of glass fibre reinforced epoxy resin.

The particles have an average diameter of about 0.05-5  $\mu$ m and are core-shell particles, preferably having a core of butadiene polymer and a shell of methacrylate polymers. 3-20 wt% of the particles are added to epoxy resin and cured to form the insulating substrate. The epoxy resin containing the particles is applied to glass fibre reinforcing material, cured and used in the manufacture of printed circuit boards. The insulating substrates may further comprise inorganic filler particles.

The insulating substrate may further comprise inorganic filler particles, preferably of talc or aluminium silicate. The inner glass fibre reinforced epoxy resin is a woven glass fibre epoxy resin and the covering glass fibre reinforced epoxy resin is a non-woven glass fibre epoxy resin, or vice-versa.

USE - These laminates can be used for printed circuit boards, particularly for use in high voltage applications such as in television tuners.

ADVANTAGE - These laminates have lower dielectric properties relative to those made solely of epoxy resins.

Dwg.0/0

Title Terms: REDUCE; DIELECTRIC; CONSTANT; PRINT; CIRCUIT; BOARD; INCORPORATE; POLYMERISE; PARTICLE; INSULATE; SUBSTRATE; REDUCE; DISSIPATE; FACTOR; INCREASE; COMPARE; TRACK; INDEX